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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Koma Kulshan Associates

Project No. 3239-025
Washington

ORDER APPROVING PLAN FOR WILDLIFE CROSSINGS

(Issued May 19, 1989)

On April 19, 1989, Koma Kulshan Associates (licensee) filed the plan for providing wildlife crossings along the project penstock as required by article 413 of the license for the Koma Kulshan Hydroelectric Project.

The licensee proposes to bury the penstock in areas where several primary big game trails have been identified. Along the steeper portions of the route, the licensee proposes to construct the penstock within a berm having a maximum slope not to exceed 2:1. If the 2:1 slope is exceeded along any section of the berm for more than 500 feet, a wildlife crossing will be constructed.

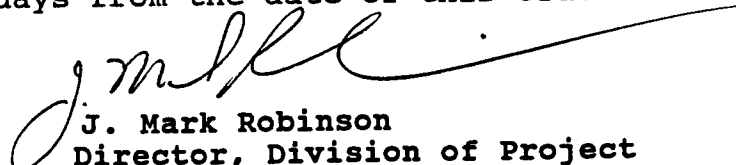
The U.S. Fish and Wildlife Service, the Forest Service, and the Washington Department of Wildlife concur with the provisions of the plan.

Construction of the penstock as described in the plan will ensure that the penstock does not impede deer and elk migration in the project area. The penstock will be buried along those portions of the route near primary big-game trails. Where the penstock is installed within a berm, the slopes of the berm will be constructed to allow big game to move across the penstock.

The Director orders:

(A) The wildlife crossing plan described in section 3.2.1 of the aquatic and terrestrial resources plan, filed on April 19, 1989, is approved.

(B) This order is issued under authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.


J. Mark Robinson
Director, Division of Project
Compliance and Administration

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE. \$300



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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Martha O. Hesse, Chairman;
Anthony G. Sousa, Charles G. Stalon,
Charles A. Trabandt and C. M. Naeve.

Puget Sound Power and Light Company) Project No. 3239-004
and McMaster and Schroder .)

ORDER ON APPEAL

(Issued December 3, 1987)

On May 13, 1987, the Puget Sound Power and Light Co. and McMaster and Schroder (licensees), licensees for the Koma Kulshan Project No. 3239, located on the Rocky, Sulphur and Sandy Creeks in Whatcom County, Washington, timely filed an appeal of the license issued to them on April 13, 1987. 1/ The licensees seek to modify Articles 401, 403, and 410 of the license. No opposition to the licensees' appeal has been received. The appeal will be granted in part and denied in part, and the license modified, as ordered herein.

Article 401

Article 401 of the license calls for preparation of an erosion control plan after consultation with a number of entities, including the Lummi and Nooksack tribes. The licensees seek to have the reference to the Lummi and Nooksack tribes deleted, to be replaced with reference to the Skagit System Cooperative (SSC), the representative of the Sauk-Suiattle, Upper Skagit and Swinomish tribes. According to the licensees, the project area is of no religious or cultural significance to the Lummi or Nooksack tribes.

The licensees' point is well taken. In the license proceeding, consultations were held with the SSC, not with the Lummi or Nooksack tribes. There being no opposition to this correction, the license article shall be modified to make reference to the SSC instead of the Lummi and Nooksack tribes.

The Article 401 also requires that the erosion control plan address protection and stabilization of the silt and banks of

1/ 39 FERC ¶ 62,040 (1987).

Project No. 3239-004

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Sandy Creek near its mouth. The licensees argue that the project's impact on erosion to the banks of Sandy Creek is very difficult, if not impossible, to measure, and is not significant when compared to erosion from other sources. The licensees assert that all parties that had expressed an interest in the question 2/ agreed that the off-site mitigation provided for in Article 410 would fully compensate for all effects of project operation on the anadromous habitat at the mouth of Sandy Creek.

The potential for increased erosion of the silt and clay banks of Sandy Creek due to operation of the proposed project, and the potential need for bank protection and stabilization, was recognized by the licensees and consulting agencies prior to issuance of the license. While further evaluation of the site and commentary on the conditions have been obtained from some of the consulting agencies, there is no clear consensus on the significance of the project's effect on erosion, or how to address the problem. 3/

Since there is no evidence as to whether several of the agencies expressing concern about the creek banks have been consulted and concur with the licensees' proposal, the provision of Article 401 requiring protection and stabilization of the banks of Sandy Creek will not be deleted. As that article mandates, all of the listed entities must be formally consulted regarding creek bank protection from any project-induced increase in bank erosion.

2/ The licensees invited the consulting agencies to participate in a field visit to the banks of lower Sandy Creek, but only three, the Washington Department of Fisheries (WDF), the U.S. Fish and Wildlife Service (FWS), and SSC attended. Article 401 requires consultation with these entities, as well as the Forest Service, the Washington Department of Game, and the Washington Department of Ecology.

3/ In support of their appeal the licensees submitted letters received from the SCC (dated February 13, 1987), the National Marine Fisheries Service (NMFS) (dated March 23, 1987), and the Washington Department of Fisheries (WDF) (dated February 17, 1987). The letters from NMFS and WDF are inconclusive, in that they do not indicate that creek bank erosion is no longer of concern or that no bank protection or stabilization need be considered. The licensees also submitted a report and February 27, 1987 memorandum of a telephone conversation between the licensees' engineering consultants and staff of WDF, which cannot however substitute for a position letter from the agency.

Article 403

The licensees request modification of Article 403 to clarify the location of powerhouse-released flow measurements necessary to evaluate compliance with the requirement of run-of-the-river mode of project operation. They argue that measuring the flow immediately downstream of the project, as currently required by Article 403, will include the flows of Sandy Creek, which do not pass through the powerhouse. The licensees propose changing the article to require measurements at the powerhouse discharge, in the project tailrace, rather than downstream of the tailrace.

Article 403 was intended to ensure operation of the project in a run-of-the-river mode. Compliance with the required mode of operation will be more accurately assessed by measuring the flow at the powerhouse discharge. Relocation of the measurement, as proposed by the licensees, is therefore appropriate.

The licensees also propose to modify Article 403 to state that flows discharged at the powerhouse would approximate the sum of the instantaneous inflow to the Rocky and Sulphur Creek impoundments, less the instream flow amounts as specified in Article 404. As written, Article 403 requires the discharge from the powerhouse to approximate the sum of the inflow to the impoundments, but does not provide for the release of the minimum flows to Rocky and Sulphur Creeks from the diversion structures, as specified in Article 404. To ensure that the project is operated in a run-of-river mode and that the minimum flows specified in Article 404 are released, Article 403 should be modified to state that the project must be operated so that the project discharge approximates the sum of the instantaneous inflow to the Rocky and Sulphur Creek impoundments, less the required minimum flows.

Article 410

The licensees propose a number of changes to Article 410, which now provides for a one-time payment of \$12,000 to the Forest Service for enhancement of anadromous fish habitat within the Mt. Baker-Snoqualmie National Forest. The proposed changes alter the due date of the payment, identify the specific river system to be benefitted by the payment, and state that such payment constitutes full mitigation for the term of the license of all anadromous fishery impacts associated with project-increased flows at the mouth of Sandy Creek.

The licensees are concerned that, as written, the article may require them to make the \$12,000 payment even if the project is not built. They propose to delete the provision of the article calling for payment within one year of issuance of the

license, and to instead provide that payment be required ninety days after construction financing is in place.

We agree that the payment for enhancement of anadromous fisheries need be made only if the proposed project is constructed. Article 301 requires that construction be commenced within 2 years from the issuance date of the license. Allowing the same period for compliance with Article 410 would assure that construction financing was in place and actual construction commenced before payment came due. This license term will be so modified.

The licensees also seek to specify that the money paid is to be used for enhancement of anadromous fisheries within the Baker River System, rather than generally within the Mt. Baker-Snoqualmie National Forest. No objections to this proposal were submitted. This modification appears to meet the intent of the parties which negotiated the anadromous fisheries mitigation, and is acceptable to the Commission.

The licensees' proposal that the payment under Article 410 shall serve to fully mitigate for the term of the license all anadromous fishery impacts is inappropriate. If the project leads to unforeseen impacts to environmental resources, including anadromous fish habitat, the licensees may be required to modify project structures under Article 16 of the license, and project operation under either Article 16 or Article 403. Therefore, this last proposed modification to Article 410 will not be made. 4/

The Commission orders:

Articles 401, 403, and 410 of the license issued to Puget Sound Power and Light Co. and McMaster and Schroder for the Koma Kulshan project shall be amended to read as follows:

Article 401 The licensee, after consultation with the Forest Service, the U.S. Fish and Wildlife Service, the Washington Department of Fisheries, the Washington Department of Game, the Washington Department of Ecology, and the Skagit System Cooperative (SSC), and within 1 year from the date of issuance of this license, shall file with the Commission a comprehensive plan to protect and to stabilize the silt and banks of Sandy Creek near the mouth of the creek and to control erosion, dust, stream sedimentation, soil mass movement, and slope stability in the project area. The plan shall include measures to minimize and control the quality of sediment or other potential water

- 4/ The licensees also suggested adding to Article 410 some essentially editorial language, which was superfluous and is therefore not adopted.

pollutants and minimize the amount of temporary stockpiling of top-soil resulting from project construction, spoil disposal, and project operation. Further, the plan shall include a description and design drawings of control measures, revegetation methods, topographic map locations of control measures, design and location of sedimentation ponds, grading of slopes, control of surface drainage, an implementation schedule, monitoring and maintenance programs for project construction and operation, and provisions for periodic review of the plan and for making any necessary revisions to the plan. The plan shall address all activities associated with construction, including upgrading of access roads and all new road construction. The licensee shall include in the filing documentation of agency and SSC consultation on the plan, and copies of agency and SSC comments or recommendations.

If the licensee disagrees with any agency or SSC recommendations, the licensee shall provide a discussion of the reasons for disagreeing, based on actual geological, soil, and groundwater conditions at the project site. The Commission reserves the right to require changes to the plan. Unless the Director of the Office of Hydropower Licensing directs otherwise, the licensee may begin project-related land-clearing, land-disturbing, and spoil-producing activities at the project 90 days after filing this plan.

Article 403. The licensee must operate the Koma Kulshan Hydroelectric Project in an instantaneous run-of-river mode for the protection of fish and wildlife resources in Sandy Creek. The licensee, in operating the project in an instantaneous run-of-river mode, must at all times act to minimize the fluctuation of the impoundment surface elevation, by maintaining a sufficient discharge from the project so that the flow, as measured at the powerhouse discharge in the project tailrace, approximates the sum of the instantaneous inflow to the Rocky and Sulphur Creek impoundments, less the minimum flows as specified in Article 404. Instantaneous run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement between the licensee and the Washington Department of Game and the Washington Department of Fisheries.

Article 410. The licensee, within 2 years from the date of issuance of the license, shall make a one-time payment of \$12,000 to the Forest Service for the costs associated with enhancing anadromous fish habitat within the Baker River System. The funds shall be provided to the Forest Service for its Mt. Baker-Snoqualmie National Forest fisheries habitat enhancement program.

By the Commission.

(S E A L)

Lois D. Cashell
Lois D. Cashell,
Acting Secretary.

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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Puget Sound Power and Light Company,
and McMaster and Shroder

Project No. 3239-001

ORDER ISSUING LICENSE
(Major Project - Unconstructed)
(Issued April 13, 1987)

Puget Sound Power and Light Company, and McMaster and Shroder (applicants) have filed a license application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Koma Kulshan Project, located in Whatcom County, Washington, on Rocky, Sulphur and Sandy Creeks.^{1/} The project would occupy lands of the United States within the Snoqualmie - Mt. Baker National Forest.

Notice of the application has been published. The motions to intervene that have been granted and the comments filed by agencies and individuals have been fully considered in determining whether to issue this license, as discussed below.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Federal Power Act (FPA), as amended by the Electric Consumers Protection Act of 1986 (ECPA), Public Law No. 99-495, requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment for the Koma Kulshan Project addresses the concerns of the federal and state fish and wildlife agencies, accept as indicated below, and makes recommendations consistent with those of the agencies.

The Department of the Interior (Interior) on behalf of the U.S. Fish and Wildlife Service (FWS) has requested that various plans that it recommends in the interest of protecting fish and wildlife resources be approved by the FWS, the Forest Service (FS), the Washington Department of Fisheries (WDF), and the Washington Department of Game (WDG). The Commission must retain its final authority to approve or disapprove various plans required to be submitted under the license. There are various articles herein requiring consultation with FWS, FS, WDF, and WDG prior to making filings with the Commission. The views of these agencies will be given full consideration prior to any Commission action on any filing pursuant to this license that affects the interests of the agencies.

The recommendations of Interior have been fully considered and are addressed in the attached Environmental Assessment.

Comprehensive Plans

Section 10(a)(2) of the FPA, as amended by ECPA, requires the Commission to consider the extent to which a project is consistent with comprehensive plans (where they exist) for improving, developing, or conserving a waterway or waterways affected by the project. The plans must be prepared by an agency established pursuant to Federal law that has the authority to prepare such a plan or by the state in which the facility is or will be located. The Commission considers plans to be within the scope of section 10(a)(2), only if such plans reflect the preparers' own balancing of the competing uses of a waterway, based on their data and on applicable policy considerations (i.e., if the preparers consider and balance all relevant public use considerations). With regard to plans prepared at the state level, such plans are within the scope of section 10(a)(2), only if they are prepared and adopted pursuant to a specific act of the state legislature and developed, implemented, and managed by an appropriate state agency.^{2/}

The staff identified one comprehensive plan of the type referred to in section 10(a)(2) of the FPA relevant to this project. The staff reviewed one resource plan^{3/} that touches on various aspects of waterway management in relation to the proposed project, as part of a broad public interest examination under section 10(a)(1) of the FPA. No conflicts were found.

Based on a review of agency and public comments filed in this proceeding, and on the staff's independent analysis, the Koma Kulshan Project is best adapted to a comprehensive plan for the Baker River, taking into consideration the beneficial public uses described in section 10(a)(1) of the Federal Power Act.

Summary of Findings

An Environmental Assessment (EA) was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

^{2/} 99 Congressional Record, section 4140 (remarks by Senator McClure, April 11, 1986).

^{3/} Northwest Power Planning Council, Northwest Conservation and Electric Power Plan, 1986; Washington Statewide Comprehensive Outdoor Recreation Plan, 1983.

^{1/} The project is the result of a settlement agreement filed by the applicants on June 25, 1986, and approved in part by the Commission on September 17, 1986. 36 FERC ¶61,299 (1986).

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if constructed, operated, and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Puget Sound Power and Light Company, and McMaster and Shroder (licensee) for a period of 50 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Koma Kulshan Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provision of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G:

| Exhibit G- | FERC No. 3239- | Showing |
|------------|----------------|------------------|
| Figure 3 | 16 | General Project |
| Figure 9 | 17 | Project Boundary |
| Figure 10 | 18 | Project Boundary |
| Figure 11 | 19 | Project Boundary |

(2) Project works consisting of: (a) an 18-foot-high, 32-foot-long diversion structure with a crest elevation of 2,770 feet msl on Rocky Creek; (b) a 48-inch-diameter, 5,100-foot-long pipeline connecting to a common forebay; (c) a 15-foot-high, 37-foot-long diversion structure with a crest elevation of 2,755 feet msl on Sulphur Creek; (d) a 48-inch-diameter, 350-foot-long pipeline connecting to a common forebay; (e) a 15-foot-diameter, 29-foot-high common concrete forebay; (f) a 45 to 48-inch-diameter, 18,810-foot-long penstock; (g) a powerhouse containing a generating unit with a rated capacity of 12,000 kW; (h) the 13.8-kV generator leads; (i) the 13.8/34.5-kV step-up transformer; (j) a 34.5-kV, 4.5-mile-long transmission line tying into the switchyard at the Upper Baker River Development, and (k) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The Exhibit G described above and those sections of Exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) This license is subject to the following articles submitted by the United States Department of Agriculture, Forest Service under section 4(e) of the Act:

Article 101. Within 6 months following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature, the licensee shall obtain from the Forest Service a special-use authorization for the occupancy and use of National Forest System lands, and that authorization shall be filed with the Director, Office of Hydropower Licensing.

The licensee may commence land-disturbing activities authorized by the license and special-use authorization 60 days following the filing date of such authorization, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Notwithstanding the authorizations granted under the Federal Power Act, National Forest System lands within the project boundaries shall be managed by the Forest Service under the laws, rules, and regulations applicable to the National Forest System. The terms and conditions of the Forest Service special-use authorization are enforceable by the Forest Service under the laws, rules, and regulations applicable to the National Forest System. The violation of such terms and conditions also shall be subject to applicable sanctions and enforcement procedures of the Commission at the request of the Forest Service. In the event there is a conflict between any provisions of the license and Forest Service special-use authorization, the special-use authorization shall prevail on matters which the Forest Service deems to affect National Forest System resources.

Article 102. Before any construction of the project occurs on National Forest System land, the licensee shall obtain the prior written approval of the Forest Service for all final design plans for project components which the Forest Service deems as affecting or potentially affecting National Forest System resources. The licensee shall follow the schedules and procedures for design review and approval specified in the Forest Service special-use

authorization. As part of such prior written approval, the Forest Service may require adjustments in final plans and facility locations to preclude or mitigate impacts and to assure that the project is compatible with on-the-ground conditions. Should such necessary adjustments be deemed by the Forest Service, the Commission, or the licensee to be a substantial change, the licensee shall follow the procedures of Article 2 of the license. Any changes to the license made for any reason pursuant to Article 2 or Article 3 shall be made subject to any new terms and conditions of the Secretary of Agriculture made pursuant to section 4(e) of the Federal Power Act.

Article 103. Notwithstanding any license authorization to make changes to the project, the licensee shall get written approval from the Forest Service prior to making any changes in the location of any constructed project features or facilities, or in the uses of project lands and waters, or any departure from the requirements of any approved exhibits filed with the Commission. Following receipt of such approval from the Forest Service, and at least 60 days prior to initiating any such changes or departure, the licensee shall file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of the Forest Service for such changes. The licensee shall file an exact copy of this report with the Forest Service at the same time it is filed with the Commission. This article does not relieve the licensee from the amendment or other requirements of article 2 or article 3 of this license.

Article 104. Each year during the 60 days preceding the anniversary date of the license, the licensee shall consult with the Forest Service with regard to measures needed to ensure protection and development of the natural resource values of the project area. Within 60 days following such consultation, the licensee shall file with the Commission evidence of the consultation with any recommendations made by the Forest Service. The Commission reserves the right, after notice and opportunity for hearing, to require changes in the project and its operation that may be necessary to accomplish natural resource protection.

Article 105. During the construction and operation of the facilities authorized by this license, the licensee shall maintain the following minimum flows:

Rocky Creek: 13 cfs, to be measured at elevation 1,100 feet. This requirement will be met by a release of no less than 5 cfs over the Rocky Creek diversion at elevation 2,252 feet from August 1 through October 31, and no less than 3 cfs for the rest of the year.

Sulphur Creek: 15 cfs, to be measured just downstream of the Sulphur Creek diversion.

The licensee may temporarily modify minimum flows if required by operating emergencies beyond the control of the licensee. The licensee may also modify minimum flows for short periods upon written consent of the Forest Service.

Article 106. The licensee shall construct, operate, and maintain a guaranteed priority stream flow device as part of the diversion/intake structure. Required stream maintenance flows listed in article 105 shall be automatically released through this device, before any flow can be diverted into the conduit. The licensee shall install a water measurement control section with a continuously-recording streamgage, downstream of the point of release of the bypass flow, that will accurately measure the bypass flow. The licensee shall provide a stage-discharge chart to the Forest Service prior to commencement of operation of the project. Forest Service approval must be obtained for the design of the bypass mechanism and the design and location of the measuring control section and streamgage prior to construction. The licensee shall file a report of the streamflow at the gaging station by December 31 of each year for the preceding water year. The report must be filed with the Mt. Baker - Snoqualmie National Forest.

Article 107. Within 1 year from the issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a fish and wildlife habitat mitigation plan approved by the Forest Service. This plan must identify requirements for construction and mitigation measures to meet Forest Service fish and wildlife habitat objectives and standards. The plan also must include dates for accomplishing these objectives and standards and must identify needs for and timing of any additional studies necessary.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 108. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for accommodation of project-induced recreation.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 109. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan, approved by the Forest Service, for the operation and maintenance of the reservoir. The plan must address at least the following: water storage and releases, including storage limitations (if any), dates and/or criteria for filling and release; procedures for flood conditions; erosion prevention in the reservoir area and spillway channel; and trash and debris removal. The plan must include an implementation schedule and maintenance program.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 110. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for the control of erosion, stream sedimentation, dust, and soil mass movement.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 111. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan, approved by the Forest Service, for the treatment and disposal of solid waste and waste water generated during construction and operation of the project. At a minimum, the plan must address the estimated quantity of solid waste and waste water generated each day; the location of disposal sites and methods of treatment; implementation schedule; areas available for disposal of wastes; design of facilities; comparisons between on- and off-site disposal; and maintenance programs.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 112. Within 1 year following the date of issuance of this license and at least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for oil and hazardous substances storage and spill prevention and cleanup.

At a minimum, the plan must require the licensee to (1) maintain in the project area, a cache of spill cleanup equipment suitable to contain any spill from the project; (2) to periodically inform the Forest Service of the location of the spill cleanup equipment on National Forest System lands and of the location, type, and quantity of oil and hazardous substances stored in the project area; and (3) to inform the Forest Service immediately of the nature, time, date, location, and action taken for any spill.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 113. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for the storage and/or disposal of excess construction/tunnel spoils and slide material. At a minimum, the plan must address contouring of any storage piles to conform to adjacent landforms and slopes, stabilization and rehabilitation of all spoil sites and borrow pits, and prevention of water contamination by leachate and runoff. The plan also must include an implementation schedule and maintenance program.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 114. Within 1 year following the date of issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System lands, the licensee shall file with the Director, Office of Hydropower Licensing, a plan approved by the Forest Service for the design and construction of the project facilities in order to preserve or enhance its visual character. The plan must consider facility configurations and alignments, building materials, color, conservation of vegetation, lighting, and screening. Project facilities of concern to this include, among other things, clearings, diversion structures, penstocks, pipes, ditches, powerhouses, other buildings, transmission lines and corridors, and access roads.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

Article 115. The licensee shall bury the transmission line along the alignment as shown in figure 1 of the Settlement Agreement. The location and depth of burial of the line are subject to approval by the Forest Service.

Article 116. The licensee shall construct road crossings over the pipeline/penstock at locations designated by the Forest Service. Such crossings must be designed to carry a loaded logging truck.

Article 117. The project area may be under timber sale contract(s). Before starting construction or removing any timber in the project area, the licensee shall develop an agreement with that timber sale purchaser(s) if the sale(s) has not been closed. The agreement must stipulate the joint use of roads and the method of disposal for timber within the project boundary and under the existing sale contract. The agreement must be approved by the Forest Service before timber removal may begin. Removal of timber in addition to that already sold to the purchaser, must be authorized by amendment to the purchaser's contract or by a separate timber sale contract sold to the licensee or another party.

Article 118. Within 1 year from the issuance of this license and before starting any activities the Forest Service determines to be of a land-disturbing nature on National Forest System land, the licensee shall file with the Director, Office of Hydropower Licensing, a detailed implementation plan approved by the Forest Service for the mitigation of impacts to sensitive, threatened, and endangered plant and animal species located within the area to be disturbed.

The licensee shall not commence activities the Forest Service determines to be affected by the plan until after 60 days following the filing date, unless the Director, Office of Hydropower Licensing, prescribes a different commencement schedule.

(E) This license is subject to the articles set forth in Form L-2, (October 1975), entitled "Terms and Conditions of License for Unconstructed Major Project Affecting Lands of the United States." The license is also subject to the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

- a. For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 16,000 horsepower.
- b. For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 36.72 acres of its lands, a reasonable annual charge as determined by the Commission in accordance with its regulations, in effect from time to time.
- c. For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 13.39 acres of its lands for transmission line right-of-way, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time.

Article 202. Pursuant to Section 10(d) of the Act, after the first 20 years of operation of the project under license, a specified reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of operation under the license, the amount of that deficiency shall be deducted from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus earnings, if any, cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserve account shall be maintained until further order of the Commission.

The annual specified reasonable rate of return shall be the sum of the annual weighted costs of long-term debt, preferred stock, and common equity, as defined below. The annual weighted cost for each component of the reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return shall be calculated based on an average of 13 monthly balances of amounts properly includable in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rates for long-term debt and preferred stock shall be their respective weighted average costs for the year,

and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10 year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 301. The licensee shall commence construction of project works within two years from the issuance date of the license and shall complete construction of the project within four years from the issuance date of the license.

Article 302. The licensee shall at least 60 days prior to start of construction, submit one copy to the Commission's Regional Director and two copies to the Director, Division of Inspections of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures. The Director, Division of Inspections may require changes in the plans and specifications to assure a safe and adequate project.

Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the licensee shall submit to the Commission's Regional Director and Director, Division of Inspections, one copy each of the approved cofferdam construction drawings and specifications and the letter(s) of approval.

Article 304. The licensee shall within 90 days of completion of construction file, for approval by the Commission, revised Exhibits A, F and G to describe and show the project as built.

Article 401. The licensee, after consultation with the Forest Service, the U.S. Fish and Wildlife Service, the Washington Department of Fisheries, the Washington Department of Game, the Washington Department of Ecology, the Lummi Tribe, and the Nooksack Tribe, and within 1 year from the date of issuance of this license, shall file with the Commission a comprehensive plan to protect and to stabilize the silt and banks of Sandy Creek near the mouth of the creek and to control erosion, dust, stream sedimentation, soil mass movement, and slope stability in the project area. The plan shall include measures to minimize and control the quantity of sediment or other potential water pollutants and minimize the amount of temporary stockpiling of topsoil resulting from project construction, spoil-disposal, and project operation. Further, the plan shall include descriptions and design drawings of control measures, revegetation methods, topographic map locations of control measures, design and location of sedimentation ponds, grading of slopes, control of surface drainage, an imple-

mentation schedule, monitoring and maintenance programs for project construction and operation, and provisions for periodic review of the plan and for making any necessary revisions to the plan. The plan shall address all activities associated with construction including upgrading of access roads and all new road construction. The licensee shall include in the filing documentation of agency and tribe consultation on the plan, and copies of agency and tribe comments or recommendations.

If the licensee disagrees with any agency or tribe recommendations, the licensee shall provide a discussion of the reasons for disagreeing, based on actual geological, soil, and groundwater conditions at the project site. The Commission reserves the right to require changes to the plan. Unless the Director of the Office of Hydropower Licensing directs otherwise, the licensee may begin project-related land-clearing, land-disturbing, and spoil-producing activities at the project, 90 days after filing this plan.

Article 402. The licensee shall consult with the U.S. Fish and Wildlife Service (FWS), the U.S. Forest Service (FS), the Washington Department of Fisheries (WDF), and the Washington Department of Game (WDG) on the final design of the project to include the design of the anti-vortexing devices and air relief valves to reduce entrainment of air to minimize gas bubble disease in fish. Within 1 year from the date of issuance of this license, the licensee must file with the Commission for approval functional design drawings of the proposed anti-vortexing devices and air relief valves. The filing must include documentation of consultation with the resource agencies and the agencies comments on the drawings. The Commission reserves the right to require changes in the functional design drawings.

Article 403. The licensee shall operate the Koma Kulshan Hydroelectric Project in an instantaneous run-of-river mode for the protection of fish and wildlife resources in Sandy Creek. The licensee, in operating the project in an instantaneous run-of-river mode, shall at all times act to minimize the fluctuation of the impoundment surface elevation, by maintaining a sufficient discharge from the project so that the flow, as measured immediately downstream of the project tailrace, approximates the instantaneous sum of the inflow to the Rocky and Sulphur Creek impoundments. Instantaneous run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement between the licensee and the Washington Department of Game and the Washington Department of Fisheries.

Article 404. The licensee shall continuously discharge from the Rocky Creek diversion structure sufficient flow to maintain a minimum flow of 13 cubic feet per second (cfs) at a stream elevation of 1,100 feet mean sea level. The minimum flow release from

the diversion structure shall not be less than 5 cfs between August 1 and November 1 and 3 cfs at all other times, or the inflow at the diversion, whichever is less, for the protection of the fish resources of Rocky Creek. From the Sulphur Creek diversion structure the licensee shall release a minimum flow of 15 cfs at all times, or the inflow at the diversion, whichever is less for the protection of the fish resources of Sulphur Creek. These minimum flow releases may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement among the licensee, the Washington Department of Game, and the Washington Department of Fisheries, the U.S. Fish and Wildlife Service, and the Forest Service.

Article 405. The licensee shall consult with the Washington Department of Fisheries (WDF), the Washington Department of Game (WDG), the U.S. Fish and Wildlife Service (FWS), and the Forest Service (FS), on the final design of the diversion structures on Rocky Creek and Sulphur Creek. The final design must incorporate features that ensures the automatic release of the minimum flows required by article 404. Within 1 year from the date of issuance of this license, the licensee shall file for Commission approval functional design drawings of the diversion structure that will ensure the automatic release of the required minimum flows. The filing shall include documentation of consultation with WDF, WDG, FWS and FS and the agencies' comments on the drawings. The licensee shall file as-built drawings with the Commission within 6 months after completion of construction. The Commission reserves the right to require changes in the functional design drawings of the diversion structure.

Article 406. The licensee, in cooperation with the Washington Department of Fisheries (WDF), the Washington Department of Game (WDG), the U.S. Fish and Wildlife Service (FWS), and the Forest Service (FS), shall develop a plan to monitor the minimum flow release required by article 404. The plan shall include the location and design of streamflow gages, a schedule for the installation of the gages, and the method of flow data collection. The plan shall also include provisions for providing WDF, WDG, FWS, and FS a record of project operations including the daily quantity of water diverted, daily record of flows over the diversion dams, and a rate of change of both diverted flows and bypassed flows. In addition, the licensee shall provide notification on and documentation of all unusual occurrences such as load rejections to WDF, WDG, FWS and FS. The Commission reserves the right to require modification to the plan. The plan shall be filed with the Commission for approval within 1 year from the date of issuance of this license, and shall include the comments of WDF, WDG, FWS and FS on the plan.

Article 407. The licensee, after consultation with the U.S. Fish and Wildlife Service (FWS), the Forest Service (FS), the Washington Department of Game (WDG), and the Washington

Department of Fisheries (WDF), shall develop and implement a plan to construct fish habitat enhancement structures in Sandy Creek for the protection of fish resources. The plan shall include but shall not be limited to the number and location of the structures and a description of procedures to be implemented in maintaining these structures. The plan shall provide for at least 1,500 square feet of additional fish habitat. The licensee must provide \$10,000 annually for 3 years for maintenance of the fish habitat enhancement structures. A copy of the plan, including documentation of consultation on the plan, with FWS, FS, WDG, and WDF, shall be submitted to the Commission within 1 year from the date of issuance of the license. Unless the Director of the Office of Hydropower Licensing instructs otherwise, the licensee shall construct the fish habitat enhancement structures in Sandy Creek as specified by the plan, and may begin construction 90 days after filing the plan. The Commission reserves the right to require modifications to the plan.

Article 408. The licensee, after consultation with the Washington Department of Fisheries (WDF), the Washington Department of Game (WDG), the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), and the Forest Service (FS) shall develop a plan to set limits on the maximum rate of change in river flow (ramping rate) for the protection of fish and wildlife resources in the bypass reach of Rocky Creek and Sulphur Creek and in Sandy Creek downstream of the tailrace. Within 1 year from the date of issuance of this license or 90 days prior to project construction, whichever comes first, the licensee shall file for Commission approval the plan for establishing ramping rates in the bypass reach of Rocky Creek and Sulphur Creek and in Sandy Creek downstream of the tailrace. The filing shall include documentation of consultation with WDF, WDG, FWS, NMFS, and FS and the agencies' comments on the ramping rates. The Commission reserves the right to require changes in the ramping rates.

Article 409. The licensee, after consultation with the Washington Department of Fisheries (WDF), the Washington Department of Game (WDG), the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), and the Forest Service (FS), and within 1 year from the date of issuance of this license, shall file functional design drawings of the diversion dams and the intake structures to be constructed at Rocky Creek and Sulphur Creek and the powerhouse to be constructed at Sandy Creek. The diversion structures shall be designed in a manner that will facilitate the flushing of accumulated sediment from the project reservoirs. The powerhouse shall be designed such that fish would be prevented from moving up into the tailrace. The filings shall include comments from WDF, WDG, FWS, NMFS and FS on the drawings. The licensee shall file as-built drawings with the Commission within 6 months after completing construction.

Article 410. The licensee, within 1 year from the date of issuance of this license, shall make a one-time payment of \$12,000 to the Forest Service for the costs associated with enhancing anadromous fish habitat within the Mt. Baker-Snoqualmie National Forest. The funds shall be provided to the Forest Service for their Mt. Baker - Snoqualmie National Forest fisheries habitat enhancement program.

Article 411. The licensee shall consult with the U.S. Fish and Wildlife Service (FWS), the Forest Service (FS), the Washington Department of Fisheries (WDF), and the Washington Department of Game (WDG), on the final design of the project to include the design of the proposed automatic shutoff valves and turbine bypass facilities. One automatic shutoff valve shall be located at Dillard Point. Within 1 year from the date of issuance of this license, the licensee shall file with the Commission for approval functional design drawings of the proposed automatic shutoff valves and turbine bypass facilities. The filing shall include documentation of consultation with FWS, FS, WDF, and WDG and the agencies comments on the drawings. The Commission reserves the right to require changes in the functional design drawings.

Article 412. The licensee shall allow representatives of the U.S. Fish and Wildlife Service, the Forest Service, the National Marine Fisheries Service, the Washington Department of Fisheries, and the Washington Department of Game, showing proper credentials, access to, through, and across the project lands, waters, and works in the performance of their official duties at any time without prior notification.

Article 413. The licensee, after consultation with the Washington Department of Game (WDG), the U.S. Fish and Wildlife Service (FWS), and the Forest Service (FS), shall develop a mitigative plan that provides for wildlife crossings and other measures to minimize the effect that the above-ground portion of the penstock may have on deer and elk migration. The plan shall be filed for Commission approval within 1 year of the issuance of the license. Comments of WDG, FWS, and FS on the plan shall be included in the filing. The Commission reserves the right to require changes to the plan.

Article 414. The licensee shall (1) limit all construction activities to the interior of the powerhouse building during December 1 through April 1 to protect elk wintering in the project area; (2) not construct on the powerhouse (except as permitted by item 1 of this article) and on the portion of the penstock within the Spotted Owl Habitat Area (SOHA) during February 1 through June 15 to protect nesting spotted owls, and if it is determined from the licensee's radio telemetry monitoring of spotted owls that spotted owls are nesting in the SOHA during February 1 through June 15, then construction cannot occur until after July 15 (if monitoring shows that spotted owls are not nesting

in the SOHA during February 1 through June 15 construction can begin after June 15); and (3) not construct the section of the transmission line from the switchyard at the Upper Baker Development of the Baker River Hydroelectric Project to Forest Service Road No. 1118 during the bald eagle wintering period of October 31 through March 31 to protect wintering bald eagles.

These construction limitations may be temporarily modified or waived upon mutual agreement among the licensee, Washington Department of Game, U.S. Fish and Wildlife Service, and the Forest Service as applicable. The Commission reserves the right to require changes in construction limitations.

Article 415. The licensee, before starting any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in this license, shall consult the State Historic Preservation Officer (SHPO) and the Forest Service, Mt. Baker-Snoqualmie National Forest (FS). If the licensee discovers previously unidentified archeological or historic properties during the course of constructing or developing project works or other facilities at the project, the licensee shall stop all land-clearing and land-disturbing activities in the vicinity of the properties, and after consulting with the SHPO and the FS, shall file with the Commission a cultural resource management plan prepared by a qualified cultural resource specialist. The management plan shall include the following: (1) a description of each discovered property, indicating whether it is listed on or eligible to be listed on the National Register of Historic Places; (2) a description of the potential affect on each discovered property; (3) proposed measures for avoiding or mitigating effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for mitigating effects and conducting additional studies. The Commission may require changes to the plan.

Before starting to excavate or to remove any archeological resource located on National Forest System lands, the licensee shall secure a permit from FS authorizing excavation or removal. The licensee shall not begin any land-clearing or land-disturbing activities, other than those specifically authorized in this license, or resume such activities in the vicinity of a property discovered during construction, until informed by the Director of the Office of Hydropower Licensing that the requirements of this article have been fulfilled.

Article 416. The licensee, before beginning project operation, shall fill, grade, and pave the Shadow of the Sentinels National Recreation Trail, provide parking for the handicapped at the trailhead, and construct a sealed-vault restroom facility adjacent to the Shadow of the Sentinels parking area designed to accommodate handicapped visitors. Installation, construction, and operation of these facilities shall be coordinated with the Forest Service. Further, the licensee, within 3 months after completing the con-

struction of all the recreation-related facilities, shall file with the Commission as-built drawings, prepared in consultation with the Forest Service, depicting the type and location of all recreation-related facilities at the project.

Article 417. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things,

establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph

(d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.


(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation,

public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) This order is issued under authority delegated to the Director and is final unless appealed under Rule 1902 to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.


Fred E. Springer
Director, Office of
Hydropower Licensing

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2.3 FISH HABITAT ENHANCEMENT PLAN

The fish habitat enhancement plan designated in FERC Article 407 indicates that 1500 ft² of additional habitat will be developed in Sandy Creek. KKA agrees to pay for all nonagency costs associated with the initial placement of enhancement structures including materials, labor, and equipment. Additionally a payment of \$12,000 will be made to the Forest Service for anadromous fish habitat enhancement within the Baker Lake system, as indicated in Article 410. KKA believes that both measures mitigate all possible impacts to resident and anadromous fish. The following discussion only addresses Sandy Creek fish habitat enhancement.

The formation of fish habitat for Sandy Creek is based on the criteria established in FERC Article 407 and discussed in Appendix B of the Settlement Agreement. (Puget Sound Power and Light Co. and McMaster and Schroeder 1986). The enhancement effort is directed at establishing trout fry and summer rearing habitat in side channels over a variety of flow operations. This criteria calls for the formation of an additional 1500 ft² of habitat at total stream flow of 125 cfs. Habitat is defined as an area with water depth greater than 0.5 feet, velocity between 0.0 and 1.0 feet per second and cover (e.g., logs, rocks, turbulences) within 2 feet.

Sandy Creek, approximately 400-800 feet below the Mt. Baker highway, has a region where habitat improvement can be made. Two side channels in this area were selected for enhancement (Drawing H-006). The left bank channel (looking downstream) currently has flows only during medium to higher discharges. This existing channel can be opened for low flow with only minor excavation at the upstream end. Currently the channel has a natural cobble bar at its upstream end. An opening 1 foot deep by 10 feet wide by 10 feet long will be made in the bar. Water will then go into this channel during all flows. To help maintain a clear channel entrance a boulders (3-4 ft diameter boulders, Drawing H-006, location C4) will be placed adjacent to the left bank to

increase velocity during high flows. In similar manner, about four large boulders will be placed at the downstream end of this channel (Drawing H-006, Location B8.5) to reduce sediment buildup at the lower channel entrance. The additional flows from the Koma Kulshan Project will also help maintain flow in this section during low flows. Channel width will be 13 to 26 feet and average about 18 feet during the new average total flow of 125 cfs resulting from the additional flow added by the Koma Kulshan Project.

Another dry channel on the right bank of the same reach will be opened to increase habitat area (Drawing H-006). Water currently flows through this channel only during annual flood stages of 2-3 foot above base water surface levels. Excavation for approximately 130 feet along the channel entrance will be required to open this channel. To keep this channel open during low flows, a rockfill with a culvert will be installed at the channel entrance (Drawing H-006). Excavated alluvial material will be spread on the stream bank terrace along the channel. The disturbed channel banks and excavated material will be seeded and mulched to minimize erosion. The channel width will be about 7-20 feet and average about 11 feet. Considerable riparian vegetation, woody debris, and some boulders currently exist along and within the channel. This will increase cover for fish, independent of additional habitat structures.

In addition to opening these channels, habitat structures will be placed in both channels. Fish rocks (i.e., large boulder, 3-4' in diameter) will be placed in the left bank channel (Drawing H-006). These large rocks will be placed in clusters about 3 feet apart and in triangular groups of three. This method was found to be very effective at providing habitat in a Vancouver Island river for juvenile steelhead, which are similar in size and habitat requirements to many of the resident trout in Sandy Creek (Ward et al. 1980). Also, two angled rock deflectors will be placed along the mid stream bank about one-half and two-thirds way down the channel to force the channel back toward the bank (Drawing H-006, Locations C6 and C7.5). In these regions, it was observed that the channel was spreading toward the

medial bar. This addition should help reduce spreading and direct the flow toward the left undercut bank, at least during medium and low flows. Smaller fish rocks (2-3 ft diameter boulders) will be placed in the right bank channel. It is anticipated that about 7 rock sections will be placed in the left channel, and another 9 in the right bank channel. Additionally, two large root balls will be placed in the right bank channel and cabled into adjacent large trees (Drawing H-006). At the entrance to the right bank channel an open buried culvert will be placed at the entrance to mainstem the flow. Also two small perforated culverts will be placed under the large culvert to augment flow to the channel and reduce chances of total blockage of flow into the channel. The culverts will be coated with material in color blending with the environment (e.g., brown, green). Natural bed material will be placed over the culverts and covered with rip-rap to prevent erosion. Two to four large boulder (3' to 4' diameter) will be placed upstream of the pipe entrance to maintain a plunge pool at the culvert entrance.

Although it will not be possible to know the exact amount of newly created fish habitat until the structures are in place KKA has made some initial estimates of the area based on certain assumptions about the results of habitat evaluation methods. The habitat evaluation methods require that at each potential or existing enhancement structure location, three transects will be established, each 10 ft apart. If the enhancement structure could influence more than 20 linear feet of stream, the distances between transects will be adjusted such that the entire area of potential influence is represented. Transects will extend only across the particular channel being evaluated. For example, as most of the enhancement activities will be concentrated in side channels, the three transects will cross only that side channel and not include the main channel. At least 10 depth and velocity measurements, along with an assessment of available object or overhead cover, will be taken across each transect. These measurements will be used to calculate the areal extent of suitable habitat present between the three transects.

The areal extent of suitable habitat will be calculated using binary depth, velocity and cover criteria information as follows. As previously described, a measurement of depth and velocity will be taken at appropriate locations on each transect. If velocity is between 0.0 and 1.0 feet per second (fps), depth is greater than 0.5 ft, and object or overhead cover (within 18 inches of the water surface) is present, the location will be considered to be suitable trout fry and summer rearing habitat. If depths and velocities do not fall in this range, or if no cover is present, the area will not be considered suitable trout rearing habitat. Cover will be considered present if the cover object is within two feet of the measurement vertical or if the measurement vertical is located within a cover created scour pool. The surface area of stream represented by each of the measurement locations providing suitable habitat (width calculated as one-half the distance to the two adjacent measurement locations and length as one-half the distance to the adjacent transect or transects) will be summed to yield total suitable area for that enhancement location.

It was assumed that each set of three clumps of rocks (i.e., the nine rock triangular groups) will affect approximately 70 percent of the stream width and the equivalent of one of the three transects that will be measured for each structure as discussed above. This means that the area for each structure on the left bank channel equals: 10 feet (distance between transects) x 18 feet (average channel width) x 0.7 (proportion of width affected by structure) = 126 ft². Similarly, the right bank channel structures will each equal 10 feet x 11 feet x 0.7 = 77 ft². Therefore, the estimated habitat area created by structures equals:

$$\text{Right Bank Channel} = 77 \text{ ft}^2/\text{structure} \times 9 \text{ structures} = 693 \text{ ft}^2$$

$$\text{Left Bank Channel} = 126 \text{ ft}^2/\text{structure} \times 7 \text{ structures} = 882 \text{ ft}^2$$

$$\begin{array}{rcl} \text{Total} & & = 1,575 \text{ ft}^2 \end{array}$$

The addition of flow to the right bank channel during average or low flow conditions and two root balls will create additional unquantified fish habitat due to the naturally occurring structures in the old stream bed. This additional habitat will supplement estimates of newly created habitat.

The habitat region will be evaluated before any habitat improvement activity is begun. This will be accomplished using the three transect method described above. This requires evaluating the existing habitat at each site where structures will be placed prior to installation. Measurements of locations in the left bank channel during natural high flows in June will be made to obtain estimates of existing habitat at 125 cfs. No pre-habitat installation measurements will be required in the right bank channel as no habitat currently exists under normal flows. Any habitat that is present in this channel after flow is added is new habitat. After one year, the habitat will again be assessed during mid-summer to determine if 1,500 ft² of habitat has been formed. All measurements will be at approximately 125 cfs, the expected median flow after the project is in operation. If less than 1,500 ft² of habitat is present, the new habitat structures will be adjusted during lower flows in late summer to minimize instream disturbance. Up to \$10,000 each year for three years after installation will be set aside by KKA to be used to maintain the sites if necessary. This figure is expressed in constant 1986 dollars as of June 1, 1986, and will be adjusted annually corresponding to the associated change in the Seattle CPI-U, SMSA all items, as published by the U.S. Department of Labor, Wage Division. KKA will be responsible for maintaining the 1,500 ft² of habitat during the three-year period. Funds not spent annually for maintenance will be kept in reserve for later years of maintenance during this three-year period. The initial, existing habitat evaluation and followup evaluation during the three-year monitoring period will be conducted by KKA. The results of these evaluations will be sent to the FS, WDW, and FWS annually within 60 days of the field measurements.

If after the three-year evaluation period, this program proves to be inadequate and habitat enhancement is not performing to expectations, another site on Sandy Creek or a different stream in the Baker River system may be selected for enhancement, and an additional 3 years of monitoring. KKA will fund nonagency cost of the additional installation and three years of monitoring. This decision will be made following consultation with the resource agencies and the evaluation of the results of the monitoring program. In Sandy Creek, two alternate sites have been initially identified as the primary areas for habitat enhancement should the current sites prove unsuccessful. The first potential site is another flood channel located approximately 50-75 ft below the left bank channel on the left side of the stream (Drawing H-006, Location B10). The side channel, which extends approximately 300 feet downstream, is currently blocked by a large log jam. This site has the possibility of being opened to the flow and having structures placed in it to enhance fry rearing area similar to the other sites. The second potential area is an old flood channel that intersects the right bank channel (Drawing H-006, Location E9). This site has the potential of being excavated to allow groundwater to flow down the channel. This could be explored by digging a pit (about 10 ft wide by 6 ft deep) and inspected during various flows to see if the source of groundwater will be available for flows to the stream channel below this area.

Specific criteria will be used to evaluate the success of the enhancement methods and decide whether another location on Sandy or other creeks within the Baker Lake system should be used to meet the enhancement objectives. If it is found that, over the three years following commencement of project operation, the average useful life-span of the enhancement structures is less than two years, the enhancement effort will be shifted to one of the alternate locations (in Sandy Creek or another Baker Lake stream). The useful life-span of each structure will be taken as the length of time between structure installation and either structure washout, or such time as the structure fails to provide suitable habitat. Average life-span of all structures will be calculated as the arithmetic mean of the life-spans

of the individual structures installed anytime during the three-year period (excluding any structures installed less than two full years before the end of the period). The three-year trial period will provide time to modify structure design in order to increase effectiveness and stability and will allow all alternate enhancement locations to be fully evaluated. If all parties agree (KKA, FS, WDW, FWS), the trial period can be adjusted to account for unforeseen circumstances. For example, it may be desirable to shorten the period if there is little or no success in keeping the structure effective over the first few years. Conversely, it may be appropriate to adjust the period if two or more uncharacteristically large floods occur during the trial period. A large flood will be defined as a flood with a recurrence interval of one in ten years or more. Again, adjustments can only be made if all parties agree. If enhancement opportunities involving methods other than instream structure placement are identified, KKA retains the option of undertaking such efforts, provided all parties agree.

Habitat placement will occur during the last year of project construction (late summer 1990). Installation will be performed during a low flow period. Habitat structure monitoring will occur during midsummer (e.g., July) flow of approximately 125 cfs. Thereafter, monitoring will be conducted annually for three years (1991 through 1993) with any needed habitat structures replacement occurring during low flow period in late summer (e.g., August-September).

During initial habitat placement, a KKA representative will be present to ensure proper excavation and placement of the structures. A Hydraulic Project Approval will be submitted for this habitat enhancement work. The results of the measurements and plans for habitat adjustment will be sent to the FS, WDW, and FWS for their review. Maintenance of the structures will be done by a KKA representative during the first three years after installations. After these three years, if the structure have met the criteria for success, KKA will no longer be involved in maintenance or monitoring of Sandy Creek habitat either with labor or funding.

Access to the left bank channel enhancement site will be by an existing old road along the left bank intersecting the Baker Lake highway (Drawing H-006, Location F10). Access is suitable for a track backhoe and can be accomplished without additional road clearing activity other than movement of 2-4 old downed logs and possibly 2 small (4" diameter) trees. The lower half of this route is not on existing road and may require some fill for truck access for boulder hauling. This route intersects the stream about 30 feet above the left bank habitat improvement area. Transport of boulders to the area will be down the edge of the cut bank. Access to the right bank channel has not been determined but it is hoped that overground access can be found in the vicinity of the lower channel to minimize disturbance of the stream during rock transport. If no suitable route is found for the right bank, rocks will be transported by loader from the left bank dump area across the medial bar to their location in the right bank channel. The exact access will be determined during the summer of 1989 or 1990 with approval of the FS and WDW. Near stream access for rock transport will be optimized to reduce impacts to the stream from multiple trips to handle the estimated 200 boulders needed for the fish structures and rip-rap.